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Vol. IV OCTOBER, 1910 No. 10

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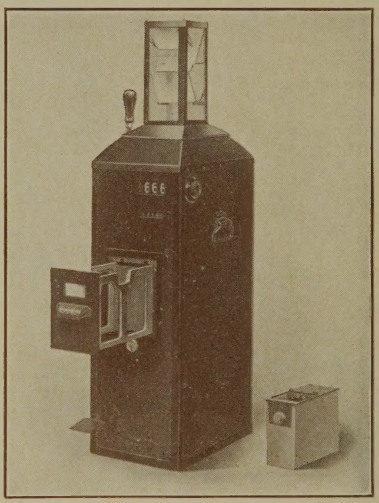
BRILL MAGAZINE

Main Street
Richmond, Va.



BRILL FARE BOX No. 1A

The advantages of the use of fare boxes in connection with prepayment cars have been so conclusively demonstrated that the question of the type of fare box best adapted to meet the requirements of your service should be the only one. Brill Fare Box No. 1A is equipped with both totalizer and register which are operated conjointly with the tilting plate on which the fares are deposited. A locked compartment with opening in the upper part of the main case is provided for envelopes containing transfers or trip reports. The pedal shown at the bottom of the fare box operates the tilting plate when the conductor is using both hands in making change and signaling.

THE J. G. BRILL COMPANY

PHILADELPHIA - - - PENNSYLVANIA

BRILL MAGAZINE

Vol. IV OCTOBER, 1910 No. 10

JAMES F. SHAW

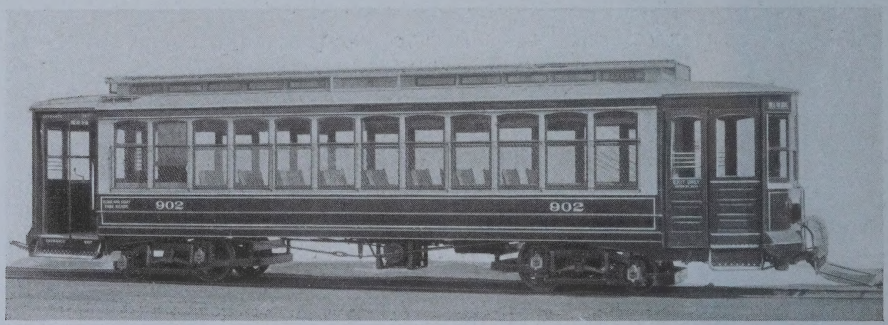
[WITH PORTRAIT INSERT]

JAMES F. SHAW, president of the American Street & Interurban Railway Association, was born in Newburyport, Massachusetts, in 1873, and was educated in the public schools. Early in 1891 he entered the employ of the Newport Car Company, first in the shops and afterward in the office. His first electric railway connection was with the Black Rocks & Salisbury Beach Street Railway Company as superintendent in 1891. In that capacity he served the road, which was operated only in the summer months, in 1891 and 1892, and in the interim devoted all of his attention to his interests in the electric railway supply business. Since 1893, Mr. Shaw has been connected with many electric railways. He has been the prime mover in the construction and operation of more than 600 miles of electric railway track, representing an investment of $15,000,000. Included in this mileage were more than 25 distinct railways, connecting 55 municipalities scattered through the counties east of and including Worcester County, Massachusetts. Many of the railways are now embodied in the Massachusetts Electric system. At one time when about 25 years of age, he was president and general manager of thirteen different electric railways. He has been a director and president of savings and trust companies, director in coal mining companies, and has been interested in cotton mills, but has been specially active in the affairs of the American Street & Interurban Railway Association which he has so ably served as president during the past two years. Mr. Shaw is prominent in Massachusetts politics and was elected to the Massachusetts Senate in 1907 and was re-elected in 1908 and 1909. While in the Senate he served on the committees on Rules, Ways and Means, and Military Affairs, being chairman of the committee on Military Affairs for two years and chairman of the Ways and Means committee during the 1909 term.

CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE

RICHMOND, VIRGINIA*

IN 1904 semi-convertible double truck cars were adopted as standard for the trunk lines in the city of Richmond, to take the place of single truck closed and open cars. The open cars, it had been found, could not be operated more than four months of the year and the closed cars which had 20-ft. bodies did not have carrying capacity to meet the requirements of the trunk lines. Aside from these considerations, an estimate of the maintenance expense and cost



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE—Earnings Have Increased Nearly 10 Per Cent. With the Operation of the Pay-As-You-Enter Cars—The Single Motor Truck Show a Saving in Current Consumption of 10 Per Cent.

of housing the double equipment showed the semi-convertible cars to be the most economical.

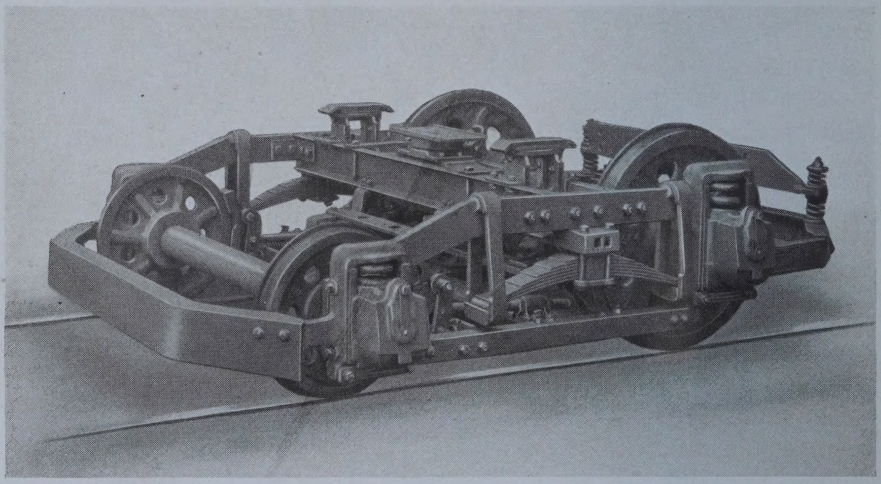
Since 1904 and until early in 1910 the standard of four motor semi-convertible cars was consistently adhered to and all purchases made from time to time were of that type, the open and closed single truck cars being displaced on all trunk lines and relegated to branch and cross-town line service and to use as trippers during rush hours and extras to handle park traffic. The double truck equipment was

* This is the twenty-second in a series of articles, each of which discusses the tramway system of some important city of the world with particular reference to the type of car which is used.

CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE—Richmond Has a Population of About 125,000 and 120 Miles of Electric Railway Track—The Situation of the City on the Banks of the James River Creates Numerous Heavy Grades

all of average weight but in line with the tendency at that time towards large cars, most of the new cars had 32-ft. bodies.

In January 1910, additional equipment being necessary, it was believed that some of the recent developments in the car, truck and motor construction indicated the advisability of a change from the standard four motor equipment of semi-convertible cars and exhaustive tests were made. These tests included, on all the lines in the Richmond traction system, actual operation of a pair of Brill No. 39-E



CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE—The Brill No. 39-E 2 Truck Which Has Been Adopted As Standard for Richmond and is Being Used to Replace Some Two-Motor Trucks Has a 4 ft. 11 in. Wheel Base and A. S. I. R. A. Standard Axles

trucks under one of the standard cars for an extended period. During this time varying weather conditions from snow and sleet and muddy track to dry, clean track were encountered.

In addition comparative instrument tests were made for current consumption of the four-motor and two-motor equipment. The tests showed that the single-motor truck equipment met the operating requirements and that there would be a saving in current consumption by their use of at least 10 per cent. Needless to say the estimate of the maintenance expense of two-motor equipment showed a decided economy over four-motor equipment. In connection with the operating tests it is worthy of note that Richmond is situated on the banks of the James River and there are a number of grades, some of

them being as high as 8 per cent. and located on curves which, owing to traffic conditions, must be ascended from a dead stop.

The choice of a new standard car, it was felt, was largely governed by the cars already in service. The general public had become accustomed to the large 32-ft. cars and it was found, favored them because of the somewhat suppositious belief that they were roomier and more comfortable, whereas actual observation showed that the number of passengers carried per square foot of floor space averaged higher on the larger cars than on the small, because of the manner in which the travelling public would inconvenience itself in order to patronize the large cars. From an exclusively operating and maintenance standpoint a 28-ft. or 30-ft. car was favored. There was little question about the advisability of adopting the Pay-As-You-Enter feature because of the economic advantages and accordingly a car of that type with the following dimensions was decided upon:

CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE
The Standard Pay-As-You-Enter Arrangement is Used With 5 ft. 10 in. Platforms of the Double-End Type

Length of car body	32 ft. 0 in.
Length of each platform	5 ft. 10 in.
Length of car over vestibule	43 ft. 8 in.
Length of car over bumpers	44 ft. 11 in.
Width of car over side sheathing	8 ft. 2 in.
Width of car, extreme	8 ft. 5 in.

CONDITIONS WHICH GOVERN THE TYPE OF CAR FOR CITY SERVICE—The Interior Finish is Cherry and the Rattan Upholstered Seats are the Brill Winner Type—The Window Arrangement is An Adaptation of the Brill Semi-Convertible

The details of truck and electrical equipment and the figures for the weight of the cars are as follows:

Trucks	Brill No. 39-E
Motors	2 G. E. 65 h. p.
Weight	
Car body with fenders and air brakes	21,280 lb.
Trucks	12,280 lb.
Motors and electrical equipment	7,973 lb.
Total	41,533 lb.

The seating capacity is 46 persons which makes the weight per seated passenger 900 lbs. The seating capacity could be increased by the use of folding platform seats and end seats between the bulkhead doors, but Mr. C. B. Buchanan, superintendent of railways of the Virginia Railway & Power Co., after careful observation found that

seats of this sort, while normally increasing the seating capacity and being useful for that purpose under such conditions as those in New York City where the Public Service Commission requires a certain number of seats, were virtually obstructions and caused delays in operation at stops and that furthermore the space was more valuable as standing room. He accordingly very wisely decided to omit them but included the end seats near the entrance doors to reduce to a minimum the loss in seating capacity from the prepayment door arrangement.

It is impossible in the scope of this article to take up in detail every minor feature of the car, which in the aggregate indicate a careful consideration of the convenience and pleasure of the travelling public and also of operating economy. The following table showing comparative receipts on the Broad and Main line before and after the entire new equipment of 20 Pay-As-You-Enter cars were placed in service, is of particular interest.

BROAD-MAIN LINE

	Earnings	Cash Fares	Tickets	Passengers Transfer	Passengers Total
P-A-Y-E Sept. 19, 20, 21	$2225.95	11524	41812	15554	68890
3 days preceding week	2070.40	8889	41142	15658	65689
3 days preceding year	1823.25	7822	36406	11940	56168

MAIN STREET LINE

September 19, 20, 21	$2036.26	9270	41171	15316	65757
3 days preceding week	2085.71	9460	42031	15669	67160
3 days preceding year	1885.08	8650	37909	13764	60323

The new cars were first operated on Sunday, September 18, 1910. The figures are for the following three days compared with the three corresponding days of the preceeding week and the same week-days exactly one year previous when the old type equipment was used. The figures for the Main street line are presented because the Main street cars are operated for a large portion of their route over the same streets as the Broad and Main cars and the decrease in earnings on the Main Street line consequently indicate fairly well the portion of the increase on the new Pay-As-You-Enter cars which is due to "curiosity" riders. The increase in cash fares and actual decrease in transfers on the Pay-As-You-Enter cars are significant features. In this connection it is worthy of note that the cars were operated with fare boxes.

MOTOR CAR FOR THE SOUTHERN RAILWAY

GAS-ELECTRIC SYSTEM

SEVERAL previous issues of Brill Magazine have described types of motor cars for light branch line service on steam railways and for owl service on electric railways. Some new lines have acquired cars of this type to develop sufficient traffic to warrant electrification or the purchase of locomotives. Most of the cars for those classes of service have been of the straight gasoline type with mechanical transmission between the combustion motor and the

MOTOR CAR FOR THE SOUTHERN RAILWAY—The Car Body is of Steel Construction and Weighs 26,500 lb. Exclusive of Any Equipment

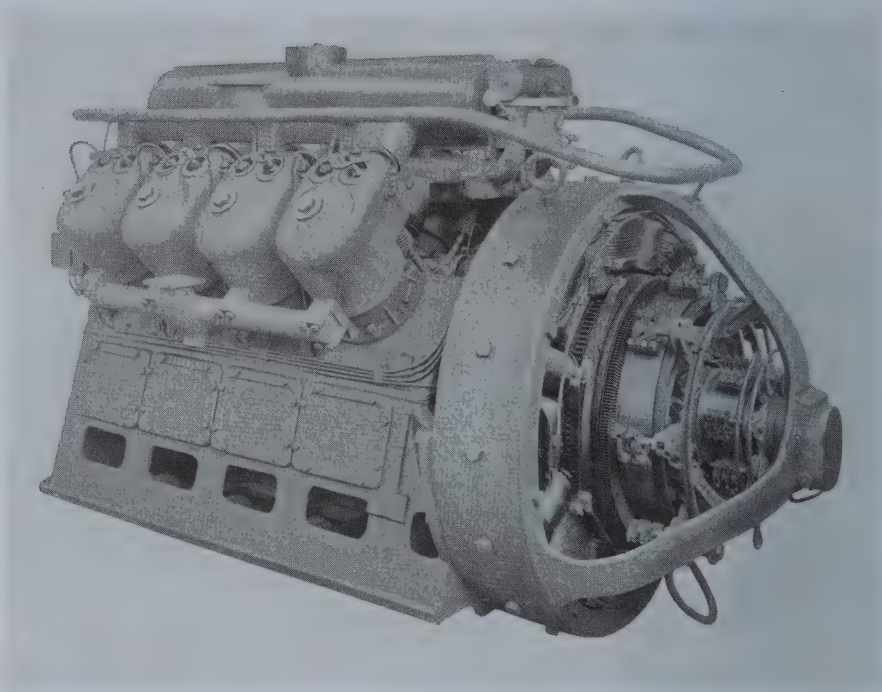
wheels and the cars have been of comparatively moderate size. There is a demand for larger cars on steam railways and on some of the newly constructed electric railways, which have a fairly heavy interurban service. The car shown in the accompanying engravings was designed to meet those requirements. The car body, which was built by the Wason Manufacturing Company, is propelled by electricity. A gasoline engine direct coupled to an electric generator forms a compact power plant in a compartment located in the front of the car. The electric power thus generated is applied to standard railway motors mounted upon the axles. The car is operated by means of a suitable controller in a manner similar to ordinary trolley cars. The advantages claimed for this system are universal speed control which is powerful, efficient, light, reliable and noiseless.

The car body is 54 ft. 8 in. long and 9 ft. wide. The underframe is of structural steel, the center sills being 6-in. I-beams, the side sills 6-in. channels and the cross joists 4-in. channels. The side posts are 2 by 2 by $\frac{1}{4}$-in. tees and the rafters $1\frac{1}{2}$ by $1\frac{1}{2}$ by $\frac{3}{16}$-in. tees, the roof being of plain arch construction in order to effect a saving in weight. The window rail is $2\frac{1}{2}$ by $1\frac{1}{2}$ by $\frac{7}{16}$ in. The weight of the

Motor Car for the Southern Railway—Interior of the Main Saloon Compartment Showing the Plain Arch Roof With Ventilating Louvres—There is Also a Smoking Compartment

car body without seats or any electrical or engine equipment is 26,500 lb.

The power plant consists of an 8-cylinder 550 r. p. m. 4-cycle gasoline engine of the V type, direct connected to an 8-pole 600-volt commutating pole electric generator and an 80-volt exciter. The generator and exciter are built by the General Electric Company in accordance with their standard practice and are specially designed to meet the conditions of service. The eight engine cylinders are 8-in. bore by 10-in. stroke and are made of a fine quality of grey iron.



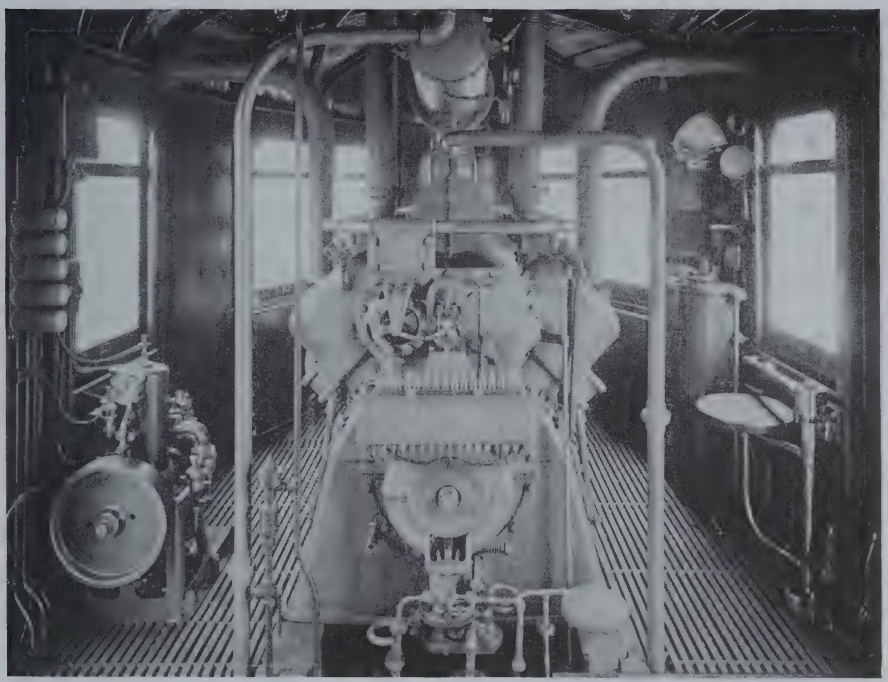
Motor Car for the Southern Railway—The Power Plant is So Compact That it Occupies A Compartment Only 11 ft. 5 in. Long

The exhaust and inlet vales, air starting valves and spark plugs are mounted in the cylinder heads which are thoroughly water-jacketed and secured by four large studs tapped directly into the crank case.

The gasolene is taken from a 100-gallon tank suspended under the car. Strainers are provided at the point where the tank is filled, and also between the tank and pump on the engine, making it impossible to obstruct the carburetor with foreign matter. A hand pump is also supplied for pumping gasolene when the engine is not in motion. A small auxiliary tank mounted on the wall of the cab provides gasolene for the float feed carburetor on the auxiliary engine. The ignition system consists of two Bosch low tension magnetos and magnetic plug.

The engine is started by means of air taken from the main reservoirs of the air brake system which are made of extra large capacity for this purpose. During the operation of the main engine the air reservoirs are charged by a single cylinder 4¾ by 4-in. air compressor

driven from the crank shaft of the engine. This compressor has a displacement of 22.5 cu. ft. of free air per minute when running at 550 r. p. m., and is provided with an automatic governor which holds the intake valve open when pressure in the reservoir reaches 90 lb.



Motor Cars for the Southern Railway—The Engine Room—The 8-Cylinder Gasoline Engine is Direct Connected to an 8-Pole Commutating Pole Generator

The car is mounted on trucks of the M. C. B. type. The forward truck is equipped with two standard 600-volt commutating pole railway motors of 100 h. p. each. The motors are mounted directly upon the axle with nose suspension and are equipped with standard gears and gear cases. The car body has a seating capacity of 61, of which 20 are accomodated in the smoking compartment and 41 in the main saloon.

PRIVATE CAR FOR MR. C. D. BEEBE

BUILT BY THE G. C. KUHLMAN CAR COMPANY

PROBABLY the finest private car in service on any electric railway to-day is the car for Mr. C. D. Beebe of Syracuse, N. Y., whose interurban properties radiate from that city to Auburn, Rochester and other surrounding cities. The car was recently delivered from the shops of the G. C. Kuhlman Car Company at Cleveland where it was built and equipped. It has the following dimensions:—

Length over vestibules	54 ft. 8 in.
Length over bumpers	56 ft. 0 in.
Width over sills including sheathing	8 ft. 4 in.
Width inside of car below windows	7 ft. 5 3/4 in.
Height top of rail to top of roof	12 ft. 10 3/4 in.

The car is designed for operation with its own motor trucks and included in the eight compartments into which the car body is divided are two for the motorman at diagonally opposite corners of the car. The remaining portion of each end has a large observation window, a lounging or smoking compartment being located at one end of the car and a handsomely fitted parlor compartment at the other end. The other compartments are a kitchen and a dining room, the kitchen located between the dining room and the smoking compartment; a toilet and lavatory and a retiring room. A passage way connects all compartments in such a manner that it is only necessary to pass through the dining room to get from one end of the car to the other.

PRIVATE CAR FOR MR. C. D. BEEBE—Mounted on Temporary Trucks for Photographing

The car is most substantially built as well as being most handsome in interior finish and accoutrements. The framing includes the Kuhlman steel plate girder narrow side construction. Each side sill is built up of 3½ by 7-in. angle, a 24 by ⅜-in. steel plate and a 7-in. channel with a 3¼ by 8½-in. yellow pine sill. The center and intermediate sills are 6-in. I-beams (12.25 lb. per ft.) with Georgia pine fillers.

PRIVATE CAR FOR MR. C. D. BEEBE—Interior of the Parlor Compartment Which is Finished in African Mahogany

There is placed under the side sills a 1⅜-in. truss rod which is anchored to the car body bolsters with heavy wrought iron anchors. The needle beams have ¾-in. truss rods. The inside truss are of 2½ by ⅜-in. wrought iron running the full length of the car body and down through the sills at either end and through forged corner sill plates which have upward extending flanges over the end sills. The bolsters are built up from steel plate and castings. The top plate is 10 by 1-in. steel and the bottom plate 10 by 1⅛-in. steel.

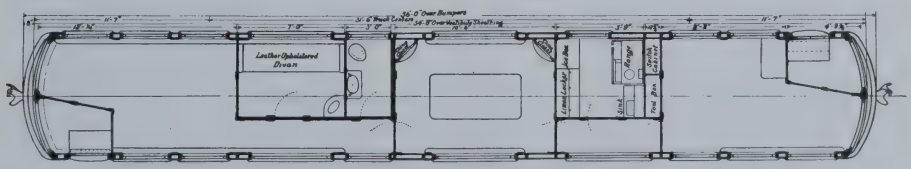
The body framing has double posts between each pair of windows. These are ash, as are the corner posts, 1¾ by 4⅜-in. securely tied together. The intermediate posts in the center of the double windows are 1¾-in. thick. All the corner and side posts have ½-in. rods through the side sill and the top of side plate with nuts and washers on each end. The side window sills are white ash. The sheathing under the window sills and on the sides of the car is ¾-in. Southern poplar.

Private Car for Mr. C. D. Beebe—The Dining Room is Finished in Mahogany with Beamed Ceiling

The roof has 17 steel carlines of ½ by 1½-in. material. The lower ends of these have feet forged on them and bolted to the top plate. The upper roof is covered with ½-in. tongue and grooved Southern poplar and the side roof with ½ and 2½-in. sheathing. The roofs are covered with No. 8 cotton duck over screen. The usual copper gutter is provided over the doors and iron molding around the end to protect the hood from the trolley rope.

PRIVATE CAR FOR MR. C. D. BEEBE—Looking Through the Passageway to the Parlor Compartment from the Smoking and Lounging Compartment

The arrangement of the motorman's cabs is shown in the accompanying plan. The floor of these cabs is covered with interlocking rubber tiling including the trap door covering over the step entrances. A folding theatre stool is provided in each cab. The smoking or lounging room is finished in Mission oak with a cabin deck type of ceiling. The compartment is furnished with a number of leather upholstered chairs of suitable design and in one corner of the room there is a writing desk. Folding wall tables are provided for both this com-



PRIVATE CAR FOR MR. C. D. BEEBE—Plan Showing Arrangement of Compartments

partment and the parlor compartment at the other end of the car. The kitchen is located next to the smoking or lounging room and is finished in white enamel. Its equipment includes a combination buffet range embodying oven, broiler and hot water heater; an ice box to hold 75 lbs. of ice and a reasonable amount of provisions; a copper covered sink with shelves above and a copper covered serving board beneath

PRIVATE CAR FOR MR. C. D. BEEBE—Another View of the Smoking and Lounging Room Which is Finished in Mission Oak With Cabin Ceiling

which are lockers for the storage of food supplies. There is ample storage room in the kitchen for utensils, dishes, glassware and linen. The floor of the room is covered with interlocking rubber tiling.

The dining room is finished in selected African mahogany with plain line inlay. The room has two china closets and its furnishings include a table large enough to seat eight persons at one time. The ceiling in the room is of beam design.

The toilet room is finished in white enamel in imitation of tiling

and has a marble floor. The fittings are handsomely finished and the lavatory has hot and cold water connections with the kitchen heater. The dividing wall between the toilet and dining room is double and deadened. Next to the toilet room is a retiring room with leather upholstered davenport and a lavatory. This compartment does not occupy the full width of the car and is entered by a door from the passageway at the side.

Private Car for Mr. C. D. Beebe—A Corner of the Retiring Room

The parlor compartment is finished in African mahogany and has a full empire ceiling. The floor is deeply carpeted and the room furnished with wicker chairs of attractive design having deeply tufted cushions. The lighting fixtures are of special design. The curtains are silk pantasote and there are draperies at the low end observation window. The windows in this and the other compartments are double and there is an ample supply of electric heaters throughout the car. Off of the lounging room is a fairly large clothes closet.

EXHIBITION CAR AT A. S. I. R. A. CONVENTION

BRILL PLAIN ARCH ROOF

THE car built by the J. G. Brill Company for the exhibition of the American Street & Interurban Manufacturers' Association is a light weight type which introduces the Brill Plain Arch Roof and includes the company's semi-convertible window system. In addition the car has pay-as-you-enter platforms, a vacuum ventilating system, the latest type of seats and is

EXHIBITION CAR AT A. S. I. R. A. CONVENTION—At First Glance the Only Evident Departure to Secure Light Weight is the Brill Plain Arch Roof

mounted on single-motor trucks which have the most recent improvements. All-in all this car is the embodiment of the latest and most widely approved principles developed by modern city conditions.

The greatest advance in the progress of city cars during the last ten years have been the semi-convertible car, the pay-as-you-enter system and the light weight car. In recent years the importance of eliminating unnecessary weight from cars has received considerable attention and the car exhibited may be considered as the result, up-to-date, of the Brill Company's developments along this line, although there has been no attempt in this case to reduce the weights to the minimum.

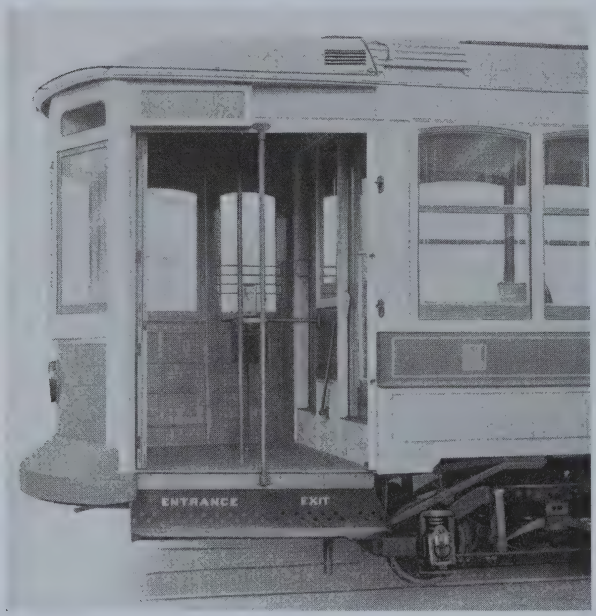
As will be seen by the illustration of the car, the appearance is distinctly characterized by the Brill Plain Arch Roof, which of course must be seen a number of times to rid the mind's eye of the lack of the monitor and enable one to correctly realize the appearance presented by the novel simplicity of the roof lines. Aside from the effect which the plain appearance of the roof has at first upon the observer, the Brill Roof has no disadvantages as compared with the monitor but

Exhibition Car at A. S. I. R. A. Convention—A Comparatively Short Acquaintance With the Brill Plain Arch Roof Convinces One of the Superior Interior Appearance Which It Gives As Well As of Its Structural Advantages

instead has a number of important advantages over the old form in addition to its lighter weight. The chief reason that the Brill Roof is lighter is that the plain arch is inherently strong where the monitor is weak. The shape of the monitor is anomalous in a construction where strength and lightness are so essential as in a car body. The Plain Arch Roof has no joints—the monitor has four. Therefore to overcome the weakness of the monitor a heavy construction has been required which being eliminated in the Brill Plain Arch Roof, the weight

is reduced about one-half. The Brill Roof has therefore been incorporated as the logical accompanyment to this light weight car.

The semi-convertible window system is also particularly adapted to light weight cars as the absence of the wall window pockets permits a lighter side construction than possible with a drop sash window arrangement. In the standard semi-convertible car the window openings are higher than with any other window arrangement; the Brill Roof permits the windows to be 4½ inches higher than standard, which adds very much to the appearance of the car from the outside and to the brightness of the interior.



Exhibition Car at A. S. I. R. A. Convention—The Ventilating Apparatus Is Located Under the Platform Hood and One of the Outlets for the Foul Air Is Shown Above the Exit

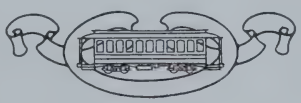
The Brill Roof lends itself to a variety of forms of ventilation. In this instance the system is that of the Vacuum Car Ventilating Company. It consists of a motor driven fan which exhausts the air through eight registers in the head lining, the air passing between the head lining and the roof to the motor driven fan which is placed on the end facia at one end of the car and passed out through ducts with openings in the end. Natural draught ventilators of the Globe type have been used in cars with the Brill Arch Roof built for Houston Electric Company, Northern Texas Traction Company, and Ogden Electric Company. The vacuum system mentioned is being installed in interurban cars under construction at present at the Brill plant for the Chicago & Joliet Railway and is also used on the cars of the

Peoples' Electric Railway of Dayton. The exhibition car is given a complete change of air every 3½ minutes by this system, i. e., the cubical contents of the car body is 1600 cubic feet and the displacement by the fan is 28,000 C. F. H., which equals 3.44 minutes per 1600 feet. The air is brought in under the car through netted openings and over electric heaters and exceeds in amount of air the requirements of the health department of one of the largest cities in the country which specifies that not less than 350 cubic feet of air per hour shall be provided per passenger based on the maximum carrying capacity of the car which shall be estimated at not less than eighty passengers.

The platforms are of the standard pay-as-you-enter type with folding doors and automatic folding steps. Hunter signs are placed over the central vestibule sash and over the entrance door and a light is placed over the exit door which gives a clear view of the exit step at night. The seats are of the Brill "Winner" type with one-piece pressed steel pedestals and pressed steel aisle and wall plates. The car is mounted on Brill No. 39-E trucks having the latest improvements in brake rigging, bolsters, transom irons and frame extensions and are similar to those recently furnished to the Metropolitan Street Railway of New York, Capitol Traction Company of Washington, D. C. and the Virginia Railway & Power Company of Richmond.

The general dimensions of the car are as follows:

Length over corner posts	30 ft. 8 in.
Length over platforms	42 ft. 8 in.
Length of platforms	6 ft.
Width over sills, including panels	7 ft. 10½ in.
Width over posts, at belt	8 ft. 2 in.
Extreme width	8 ft. 3½ in.
Height from track over top of trolley boards	11 ft. 7½ in.
Centers of posts	2 ft. 8 in.
Seating capacity	41



SINGLE TRUCK CARS FOR DAYTON, OHIO

BRILL PLAIN ARCH ROOF

STILL another type of car with the Brill Plain Arch Roof is shown in a lot of five single truck Pay-As-You-Enter cars built by the G. C. Kuhlman Car Company for the Peoples Railway Company of Dayton, Ohio. These cars exhibit the same pleasing interior and symmetrical exterior as the light weight car with Brill roof which is exhibited at the Convention of the American Street & Interurban Railway Association and described on another page of this issue. A mechanical exhaust system of ventilation is used for both types of cars.

The Dayton cars have straight sides and longitudinal seats. The windows are arranged with double sash, the top one of which is stationary and the lower arranged to raise. Each car has the following dimensions:—

Length of car body over end panels	20 ft. 0 in.
Length over vestibule sheathing	34 ft. 0 in.
Width at sill including panels	8 ft. 0 in.
Height from rail over trolley boards	11 ft. 3 in.

The Pay-As-You-Enter doors in the bulkheads at both entrance and exit slide towards the center of the car. The platforms are com-

SINGLE TRUCK CARS FOR DAYTON WITH BRILL PLAIN ARCH ROOFS—The Cars are the Pay-As-You-Enter Type and Have Full Vestibules With Mutually Operating Sliding Doors and Steps The Car is Mounted on a Temporary Truck for Photographing

pletely vestibuled and are the double end type. The door on the brake shaft side of the car is located at the crown piece and the door on the controller side next to the corner post of the car body. The doors do not slide into a pocket such as is frequently built, but slide past the inside panel. All four doors are fitted with a mutually opera-

SINGLE TRUCK CARS FOR DAYTON, OHIO, WITH BRILL PLAIN ARCH ROOFS—The Ventilating Registers in the Ceiling Open into an Air Chamber Between Ceiling and Roof—The Foul Air is Withdrawn Through these Ventilators by a Motor Driven Exhaust Fan

ting device in connection with the folding step which is so arranged that the step lowers before the opening of the door exceeds twelve inches. Each platform is 6 ft. 6½ in. long.

The cars have 4 by 7¾-in. side sills which are reinforced with 12 by ⅜-in. steel plate. The wheel pieces are 4¼ by 7 in. reinforced with 7 by ⅜-in. plate and the end sills are white oak 3½ by 9¼-in. reinforced with 7-in. channels. The white oak center cross joist is reinforced with 4 by ½-in. plate. The ends of the cars are protected with Brill angle iron bumpers.

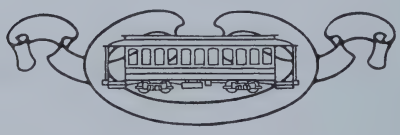
The Brill Plain Arch Roof is strengthened with the usual concealed steel rafters $\frac{5}{8}$-in. thick. A space of 4 in. is allowed between the roof boards and the ceiling for the air space and ventilators which exhaust the air from the car by means of a motor driven fan located in a housing under the platform hood. One of the exhaust openings is shown in the side elevation view of the car.

The interior finish of the cars is cherry and the ceiling is composition board. The longitudinal seats are covered with Wilton carpet. There are two lockers under the seats at diagonally opposite corners of each car. The seats are supported with plain legs and under them are truss plank electric heaters through which the incoming cold air passes from intakes in the floor.

The special equipment of the cars includes Brill Dedenda pedal alarm gongs under each platform and Brill patented signal bells. The figures for the weight of the car are as follows:—

Car body	14,100 lbs.
Truck	6,940 lbs.
Motors	6,540 lbs.
Total	27,580 lbs.

The truck has a 7-ft. 6-in. wheel base and will be used on track with minumum radius of curve 35 ft. The track gauge is 4 ft. 8½-in. and the wheel diameter 33 in.



EQUIPMENT FOR THE CITIZENS RAILWAY, WACO, TEXAS

ONE-MAN PREPAYMENT CARS

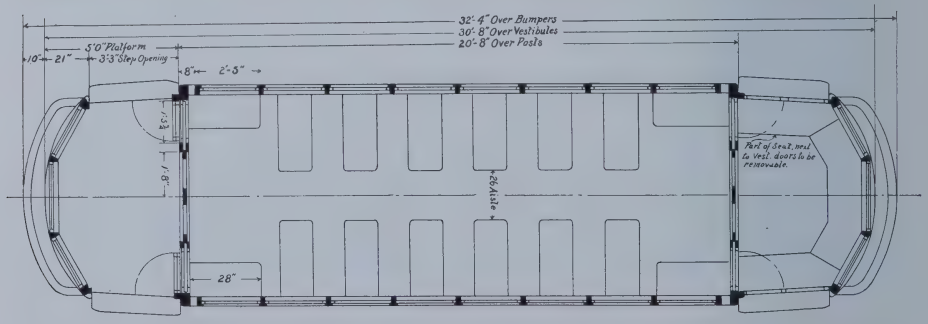
DURING the month of June there were delivered to the Citizens Railway Campany of Waco, Texas, by the Danville Car Company three single truck cars for one-man prepayment operation. Since the cars were placed in operation very gratifying results have been obtained and the indications are that the accident expense will be reduced to about one-half the former figure; that the gross receipts will show an increase of about 10 per cent. over the receipts of the old cars under the former methods of operation, due, the management believes, to the greater popularity of the new cars and service; that practically all of the fares are now collected and turned over to the company, whereas under the old system at least 5 per cent. were missed; that there will be a saving of about 6 per cent. in trainmen's wages by building and operating the car so that one man is at all times sufficient for its proper handling.

EQUIPMENT FOR THE CITIZENS RAILWAY, WACO—The Vestibule Doors on the Back Platform Are Closed and Locked and the Steps Are Removed—The Trainman on the Front Platform Serves Both as Motorman and Conductor

Waco, Texas, is a city of 30,000 inhabitants. As in most cities of approximately the same size the traffic and earnings of the street railway system are not sufficient to justify the employment of conductors on cars. However, when unaided by a conductor the motorman is required not only to watch the tracks and operate the car, but to watch the entrance and exit of passengers and to see that their fares are collected and that the necessary transfers are issued. Under these conditions the service can hardly be made rapid or satisfactory, fares are missed in abnormally large numbers and legitimate and other claims on account of accidents accumulate at a rapid rate. The accident and legal accounts of small roads operated in this manner are usually excessively high because it is difficult for the company to successfully defend the claims in the absence of a conductor or other witness, to disprove the statements made by the plaintiff who is frequently unprincipled. The compromise plan of having conductors on cars during rush hours involves maintaining a force of extra men, at considerable expense, who are not as efficient as regular conductors and to whom it is difficult to offer employment sufficiently attractive to retain them in service for any length of time. The cars shown in the accompanying engravings were designed to meet these conditions. Each car has the following dimensions:

Length of body over corner posts	20 ft. 8 in.
Length of each platform	5 ft. 0 in.
Length of car over bumpers	32 ft. 4 in.
Width over sills	8 ft. 2 in.

The car is entered through the right-hand door on the front platform, where the fare is deposited by the passenger in a fare box.



EQUIPMENT FOR THE CITIZENS RAILWAY, WACO—The Semi-Circular Bench on the Back Platform Seats Eight to Ten Persons—The Platform is Used for a Smoking Compartment

The body of the car, which is particularly roomy adjoining the doors, is used in the regular way, provision being made for negroes on the rear seats in the main portion of the car, when it is to be used in the Southern States. The steps of the rear platform are entirely removed, and the doors are closed and locked. A shield protects the rear bumper, leaving no overhanging parts on which boys or others

Equipment for the Citizens Railway, Waco—Interior View Showing the Bench for Smokers on the Back Platform

may sit or hang. In addition to the regular sash on the doors and windows of the rear vestibule, which can be opened or closed at will, there are screens to prevent entrance or exit through these openings. A semi-circular bench, seating from eight to ten persons, is a part of the regular equipment of the rear platform, which is utilized as a smoking compartment. This feature increases the seating capacity of the car considerably, and has proven to be very popular. The passengers leave by way of the front platform, passing out the right-

hand door, under ordinary conditions, although on single tracks and in times of heavy traffic the left-hand front door is available as an exit. Transfers are issued when desired as the passengers leave the car, a transfer-issuing machine being employed for this purpose.

EQUIPMENT FOR THE CITIZENS RAILWAY, WACO—All Passengers Board and Leave by the Front Platform and Deposit Their Fares in a Brill Fare Box

With the natural tendency on the part of passengers to congregate on the rear platform this method assists materially in distributing the passengers evenly throughout the car and in utilizing the car to its full capacity without causing passengers to suffer discomfort from crowding. The issuance of transfers as the passengers leave has not been found to delay their exit perceptibly, and has proven satisfactory in every particular. The fare box which is used for the collection of fares is the Brill No. 4-A type. Each trainman on starting out is given a supply of change and additional change can be obtained from the office, which all but two lines of cars pass. An office employe meets the cars of the other lines at intervals in order to furnish the trainmen with change. With only one entrance and exit to watch, and with that close at hand, and with the burden removed of collecting fares and issuing transfers, the motorman is able to devote his whole attention, while the car is in motion, to its operation.

BRILL MAGAZINE

Published on the fifteenth of each month by the

PUBLICITY DEPARTMENT OF THE J. G. BRILL COMPANY

In the interests of The J. G. Brill Company, American Car Company, John Stephenson Company, G. C. Kuhlman Car Company, Wason Manufacturing Company, Danville Car Company, Compagnie J. G. Brill.

ON another page of this issue is presented a description of a light weight car which The J. G. Brill Company is exibiting at the convention of the American Street & Interurban Railway Association. The car is neither the lightest car yet built nor is it the final word in light weight construction. But we believe that it is the lightest car that can consistently be built in keeping with established principles of design and construction and with reasonable assurance of suf-

signed light car we have preferred to examine carefully the suggestions and attempts of others, meanwhile working out various designs of our own and comparing them point for point with each other and with existing construction which had demonstrated its qualities in service. The result of our efforts is to be found in the Brill Plain Arch Roof Car. The most radical departure from previous standards of design is the roof which we believe is an advance in more ways than one and is destined to be generally adopted for city electric railway cars. Yet this new feature by no means gives the car an appearance of a freak. The roof construction is a considerable factor in weight saving. Others are the underframing which is largely steel and the patented channel knees. But principally there has been a saving of weight by reducing the weight of a large number of individual items. Further saving can be effected but we are not yet ready to recommend it.

NO influence has had greater force in developing light weight equipment than the increased cost of operation. With inability to meet this increase with increase in fare, the need for reducing operating expenses has grown more insistent each month, if not each day, and light weight equipment is only one of the means which

have been hit upon. The question is, how long will it be before all of the different paths to a reduction have been exhausted. Doubtless American inventive genius and executive ability will develop many devices and means to help, but it is apparent even now that these are not being found with sufficient rapidity to maintain earning capacity or even a fair return on investment. In the face of this economists tell that the cost of living for railways as well as for people will continue to advance and that rates of fare will advance slowly if at all. What is to be done? We have already pointed out that the increased efficiency of operation is the principal remedy. But it is not too early nor a hopeless task to commence work for increased rates of fare. Encouragement may be taken from the accomplishments of the steam railways along this line which already give evidence of bearing fruit. Unless signs fail the interstate carriers will have permission to advance rates at an early date. This permission, however, has not been obtained without effort and it has only been obtained by the cooperation of the principal interests concerned in the welfare of the railways. The railways themselves are maintaining a publicity bureau at Washington, the manufacturers and dealers in railway supplies have organized the Railway Business Association which has carried on a campaign of education among the employees of its members to convince them, and through them the public, that agitation and legislation against the railways is a menace to their own and the public prosperity. The railway employes through their brotherhoods and unions have joined in petitioning for the permission asked by railways themselves. With all this organization and co-operation the hoped for increases in rates are for the most part still to be obtained. Perhaps they would have been obtained earlier if the railways had begun to marshall their forces sooner. At any rate it will be well for some of the leaders in the American Street & Interurban Association to consider the wisdom of developing the machinery to assist them in the critical period when an advance in rates will be an absolute necessity and when, unless it is convinced of its justness, the public will refuse to permit it. Some of the electric railways are already doing individual work along these lines. Co-operative efforts would be more effective.

SUPPLEMENT TO BRILL MAGAZINE
OCTOBER, 1910

The Brill Exhibition at the Annual Railway Appliance Exposition of the American Street & Interurban Railway M'frs' Ass'n, Million Dollar Pier, Atlantic City, N. J., Oct. 10-14

Part of the Reception Room in Which were Shown Six Types of Fare Boxes, Four Styles of "Winner" Car Seats, and Patented Specialties including "Half-Ball" Brake Hangers

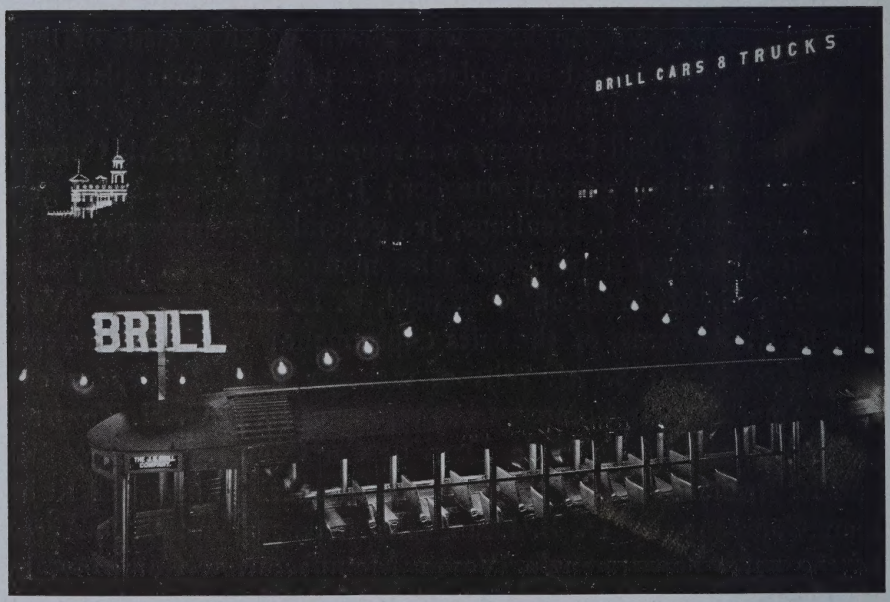
The Truck Section of the Brill Exhibition at the Rear of the Reception Room
Five Types of City and Interurban Trucks were Shown

The Most Prominent Exhibit at the Convention This Year was the Brill Semi-Convertible Car with Brill Plain Arch Roof. The Car was Placed on the Boardwalk Near the Main Entrance to the Pier Where the Excellent Proportions of the Exterior and the Bright and Attractive Interior were Seen to the Best Advantage

THE exhibition of the Brill and allied Companies consisted of the Brill Semi-Convertible Car with Brill Plain Arch Roof, described in this issue of Brill Magazine. Weight of body, less electrical equipment, 15,000 lbs.; weight of pair of No. 39-E single-motor trucks, 9,100 lbs. No. 21-E single truck, No. 39-E single-motor truck, No. 27-FE1 short-base pivotal truck, No. 27-M.C.B.1 light interurban truck, and No. 27-M.C.B.3 heavy interurban truck. Six types of Brill fare boxes, including four-till boxes, portable boxes; a nickel and a penny, nickel and dime separating boxes. Four Brill "Winner" car seats with pressed-steel pedestals, aisle and wall plates; high and low backs and cane, leather and plush upholstery. Pressed-steel pedestals with and without foot-rests and with and without offset brackets were shown separately. Rolls of lined and unlined woven cane were also exhibited. Two aluminum models of the Brill "Half-Ball" brake-hanger; a Brill track scraper, folding gate, ratchet brake handle, brake shaft, brake chain slack adjuster, "Dumpit" sand box, "Dedenda" platform gong and other patented specialties, together with a selection of car and truck springs. A new type of platform knee was shown which is made of light channel sections tested to a platform load of six tons placed on the outer half of the platform.

The J. G. Brill Company was represented by S. M. Curwen, vice-president and general manager; J. W. Rawle, assistant general manager; W. H. Heulings, Jr., general sales manager; A. N. Hargrove, foreign department sales manager; S. T. Bole, sales engineer; G. M. Haskell, J. E. Brill, F. L. Markham, A. S.Vane and F. A. Richards, of the sales department; W. S. Adams, consulting engineer; S. M. Wilson, manager publicity department. The American Car Company was represented by G. H. Tontrup, general manager (also of the Danville Car Company); F. W. Brill and E. Bronenkamp, of the sales department. The G. C. Kuhlman Company, by D. B. Dean, sales manager, and C. S. Ayres, of the sales department. Wason Manufacturing Company, by A. H. Pease, secretary, and C. F. Rice, works manager. John Stephenson Company, by L. A. Kling, superintendent.

The Brill Exhibition on the Pier was Most Favorably Located at the Left Side of the Main Lobby, Next to the Offices of the Association



The Pier at Night from the Window of Building on the Boardwalk Showing the Brill Car in the Foreground and the 100-Foot Electric Sign Over the Main Building on the Pier

ALL-STEEL CAR BODIES

The reputation of The J. G. Brill Company in handling steel in truck construction is well known. Our facilities and ability extend to the use of steel in car construction as well. Two all-steel 60 ft. cars like the one shown above which were delivered from the Philadelphia plant recently compare favorably in construction with the heavy steel equipment used by the steam lines in express service. At Springfield several steel motor car bodies are under construction for one of the large electric companies which has developed a successful gas-electric motor car. A recent addition to the Philadelphia plant provides more room for the construction of steel underframes and cars. Send us your inquiries for steel equipment.

THE J. G. BRILL COMPANY
PHILADELPHIA - - - PENNSYLVANIA

UNIVERSITY OF ILLINOIS-URBANA
3 0112 120139834

THE J. G. BRILL COMPANY

Main Office
PHILADELPHIA, U. S. A.
Cable Address: "BRILL" Philadelphia.

London Office
110 CANNON STREET, E. C.
Cable Address: "AXLES," London.

AMERICAN CAR COMPANY
St. Louis, Mo.

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Springfield, Mass.

DANVILLE CAR COMPANY
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COMPAGNIE J. G. BRILL

14 Place de Laborde, Paris
Cable Address: "BOGIBRIL."

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